

Remarks:

Reconsideration of the application is requested. Claims 12-27 remain in the application. Claim 13 has been amended.

In item 2 of the Office action, the Examiner rejected claims 12-15 as being fully anticipated by Prince, Jr. under 35 U.S.C. § 102(b). The rejection has been noted and the claims have been amended in an effort to define more clearly the invention of the instant application. Support for the changes is found at the following:

Specification page 4, lines 21-25;  
Specification, page 6, first paragraph; and  
Relabeled Fig. 2.

Before discussing the prior art in detail, a brief review of the invention as claimed is provided. Amended claim 13 calls for, *inter alia*, a controllable current source circuit having the following features:

an output;

a supply voltage terminal and a reference potential terminal;

a connection node;

a first driver stage having a first controlled path containing a first transistor and a second driver stage having a second controlled path containing a second transistor having a control terminal, said first and second controlled paths connected in series between said voltage supply terminal and said reference potential terminal, and said second driver

stage forming a part of a first current mirror circuit causing a constant stabilized current to flow in said second driver stage[; and], only said first driver stage switching on and off in dependence on an input signal, and said second driver stage being switched on and carrying a stabilized current;

at least two current paths connected between said connection node and said reference potential terminal, each of said at least two current paths including a further transistor having a respective control terminal, said control terminals of said further transistors being connected to said control terminal of said second transistor;

a phase comparator stage being connected between said connection node and said voltage supply terminal and including a switching element and at least two current paths connecting said switching element to said voltage supply terminal; and

a second current mirror circuit having a primary side and a secondary side;

one of said current paths of said phase comparator stage including said primary side of said second current mirror circuit; and

said secondary side of said second current mirror circuit including said first transistor.

To assist in identifying the claimed features in the drawing, claim 2 has been relabeled. One should note the following.

At least two current paths, each including a further transistor, are connected between the connection node 21 and the reference potential terminal 13. The second transistor of the second driver stage forms a part of a first current mirror circuit. The other part of the first current mirror circuit

is not shown. The other (un-shown) part would be connected to the input terminal 14.

The second current mirror circuit is shown in the upper right-hand portion of the circuit diagram of Fig. 2. The primary side of this current mirror circuit is the side where the collector and base of the bipolar transistor are couple to each other. This primary side is the left-hand portion of the second current mirror circuit. The secondary side of the second current mirror circuit includes transistor 17.

The switching element is described in the specification at page 4, lines 21-25. The switching element is a two-stage current switch that includes the transistors that are connected to the input terminals 4 and 2. The current paths of the phase comparator stage and those elements that connect the colletros of the transistors of input terminals 2 to the supply voltage terminals. Depending on the actual constellation of signals 3 and 5 applied to the input terminals 2 and 4, the current impressed on the connection node 21 flows through either one of the at least two current paths of the switching element.

Page 6, first paragraph, of the specification describes the switching states of the switching element and the resulting current through the transistor 17. To repeat, the current

though the transistor configuration 20, depending on the switching state of the phase comparator stage flows through the current path that is connected to terminal 15. The current path connected to the terminal 15 is the primary side of a further current mirror. The further current mirror mirrors the current defined by configuration 20 in the transistor 17. Thus, in one of the switching states of the phase comparator stage, the current through the transistor 17 is being added to the output terminal 8 and sends a current to terminal 8. If the phase comparator state is in the complementary switching state, the current through the transistor configuration 20 flows through the current path formed by the transistor 22. The transistor 17 does not provide a current, and output terminal 8 drains a current through the transistor 18.

In contrast to the invention, Prince, Jr. shows a switching element Q8, ... Q13 in Fig. 2. It does not show the combination of at least two current paths connecting the connection node (bases of Q8, Q9) to the reference potential VEE in combination with a primary side of a second current mirror connecting the switching element to the supply potential terminal VCC and a secondary side including the transistor of the second driver state. Instead, Prince, Jr. uses one current path (transistor with current I2) and simple resistors

R1, R2, respectively, to connect the switching element to the transistor Q3.

In addition, Prince, Jr. is silent regarding the relevant magnitude of currents between the switching stage I2 and the current through the output stage (through Q3). Because both paths (I2, Q3) include only one transistor connected to the potential VII, it is to be assumed that both currents have the same magnitudes. The transistor Q3 in Prince, Jr. receives a control current IRN, which is supplied externally. In contrast, the invention claims to mirror the supply current of a current switch into the output transistor. This not taught or suggested by Prince, Jr.

Accordingly, none of the references, whether taken alone or in any combination, either show or suggest the features of claim 13. Therefore, claim 13 is patentable over the art. Moreover, because all of the dependent claims are ultimately dependent on claim 13, they are believed to be patentable as well.

In light of the arguments regarding the base claim (claim 13), the rejection in item 4 of the Office action of claims 16-17 as being obvious over Price, Jr. (U.S. 5,635,863) under 35 U.S.C. § 103(a) is now moot.

In view of the foregoing, reconsideration and allowance of claims 12-27 are solicited. In the event the Examiner should still find any of the claims to be unpatentable, please telephone counsel so that patentable language can be substituted.

Petition for extension is herewith made. The extension fee for response within a period of one month pursuant to Section 1.136(a) in the amount of \$110 in accordance with Section 1.17 is enclosed herewith.

Please charge any other fees that might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner and Greenberg, P.A., No. 12-1099.

Respectfully submitted,

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August 29, 2003

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Applicants : Xiaopin Zhang et al.  
Appl. No. : 09/624,438  
Filed : July 24, 2000  
Title : Controlable Current Source Circuit and  
Phase Locked Loop Equipped Therewith  
Examiner : Linh M. Nguyen  
Group Art Unit : 2816

REQUEST TO APPROVE DRAWING CHANGES

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

S i r :

Please approve the drawing changes that are marked in red on  
the accompanying informal drawings.

Respectfully submitted,

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